



Universiteit  
Leiden  
The Netherlands

## Extension of operators on pre-Riesz spaces

Zhang, F.

### Citation

Zhang, F. (2018, September 20). *Extension of operators on pre-Riesz spaces*. Retrieved from <https://hdl.handle.net/1887/65567>

Version: Not Applicable (or Unknown)

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/65567>

**Note:** To cite this publication please use the final published version (if applicable).

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/65567> holds various files of this Leiden University dissertation.

**Author:** Zhang, F.

**Title:** Extension of operators on pre-Riesz spaces

**Issue Date:** 2018-09-20

# Bibliography

- [1] Y. A. Abramovich and C. D. Aliprantis. *An invitation to operator theory*, volume 50. Graduate Studies in Mathematics, Amer. Math. Soc., Providence, Rhode Island, 2002.
- [2] Y. A. Abramovich, Z. Chen, and A. W. Wickstead. Regular-norm balls can be closed in the strong operator topology. *Positivity*, 1(1):75–96, 1997.
- [3] Y. A. Abramovich and A. K. Kitover. A solution to a problem on invertible disjointness preserving operators. *Proc. Amer. Math. Soc.*, 126(5):1501–1505, 1998.
- [4] Y. A. Abramovich and A. K. Kitover. A characterization of operators preserving disjointness in terms of their inverse. *Positivity*, 4(3):205–212, 2000.
- [5] C. D. Aliprantis and O. Burkinshaw. Positive compact operators on Banach lattices. *Math. Z.*, 174(3):289–298, 1980.
- [6] C. D. Aliprantis and O. Burkinshaw. *Positive Operators*. Academic Press, Inc., London, 1985.
- [7] C. D. Aliprantis and E. Langford. Order completions of Archimedean Riesz spaces and l-groups. *Algebra Universalis*, 19(2):151–159, 1984.
- [8] W. Arendt. On the o-spektrum of regular operators and the spectrum of measures. *Math. Z.*, 178(2):271–287, 1981.

- [9] W. Arendt. Spectral properties of Lamperti operators. *Indiana Univ. Math. J.*, 32(2):199–215, 1983.
- [10] W. Arendt. Characterization of positive semigroups on Banach lattices. In R. J. Nagel, editor, *One-Parameter Semigroups of Positive Operators*, volume 1184 of *Lecture Notes on Mathematics*, chapter C-II, pages 247–291. Springer Verlag, Berlin, Heidelberg, New York, Tokyo, 1986.
- [11] W. Arendt. Characterization of positive semigroups on Banach lattices. In R. J. Nagel, editor, *One-Parameter Semigroups of Positive Operators*, volume 1184 of *Lecture Notes on Mathematics*, chapter A-II, pages 25–59. Springer Verlag, Berlin, Heidelberg, New York, Tokyo, 1986.
- [12] W. Arendt. Characterization of positive semigroups on  $C_0(X)$ . In R. J. Nagel, editor, *One-Parameter Semigroups of Positive Operators*, volume 1184 of *Lecture Notes on Mathematics*, chapter B-II, pages 122–162. Springer Verlag, Berlin, Heidelberg, New York, Tokyo, 1986.
- [13] W. Arendt, P. R. Chernoff, and T. Kato. A generalization of dissipativity and positive semigroups. *J. Operator Theory*, 8(1):167–180, 1982.
- [14] G. Buskes and A. C. M. van Rooij. The vector lattice cover of certain partially ordered groups. *J. Austral. Math. Soc. (Series A)*, 54(3):352–367, 1993.
- [15] Z. Chen and A. W. Wickstead. The order properties of  $r$ -compact operators on Banach lattices. *Acta Math. Sin. (Engl. Ser.)*, 23(3):457–466, 2007.
- [16] P. Clement, H. J. A. M. Heijmans, S. Angenent, C. J. van Duijn, and B. de Pagter. *One-Parameter Semigroups*. North Holland. CWI Monograph 5, Amsterdam, 1987.
- [17] J. B. Conway. *A course in functional analysis*, volume 96. Springer Science & Business Media, 2013.
- [18] E. de Jonge and A. C. M. van Rooij. *Introduction to Riesz spaces*, volume 78. Math. Centre Tracts, 1977.

- [19] B. de Pagter. A note on disjointness preserving operators. *Proc. Amer. Math. Soc.*, 90(4):543–549, 1984.
- [20] B. de Pagter. Irreducible compact operators. *Math. Z.*, 192(1):149–153, 1986.
- [21] P. G. Dodds and D. H. Fremlin. Compact operators in Banach lattices. *Israel J. Math.*, 34(4):287–320, 1979.
- [22] K.-J. Engel and R. Nagel. *One-parameter semigroups for linear evolution equations*. Springer Science + Business Media, Netherlands, 1999.
- [23] K. J. Engel and R. Nagel. *One-parameter Semigroups for Linear Evolution Equations*. Graduate Texts in Mathematics 194, Springer-Verlag, New York, 2000.
- [24] T. Hauser and A. Kalauch. Order continuity from a topological perspective. *arXiv preprint arXiv:1711.02929*, 2017.
- [25] C. B. Huijsmans and B. de Pagter. Invertible disjointness preserving operators. *Proc. Edinb. Math. Soc.*, 37(2):125–132, 1994.
- [26] C. B. Huijsmans and W. A. J. Luxemburg. *Positive operators and semigroups on Banach lattices*. Springer Science + Business Media, Netherlands, 1992.
- [27] C. B. Huijsmans and A. W. Wickstead. The inverse of band preserving and disjointness preserving operators. *Indag. Math. (N.S.)*, 3(2):179–183, 1992.
- [28] A. Kalauch. On positive-off-diagonal operators on ordered normed spaces. *Journal of Analysis and its Applications*, 22(1):229–238, 2003.
- [29] A. Kalauch. *Positive-off-diagonal operators on ordered normed spaces and maximum principles for  $M$ -operators*. PhD thesis, TU Dresden, 2006.
- [30] A. Kalauch. Structures and operators in pre-riesz spaces and stability of positive linear systems. Habilitationsschrift, Technische Universität Dresden, Germany, 2013.

- [31] A. Kalauch, B. Lemmens, and O. van Gaans. Riesz completions, functional representations, and anti-lattices. *Positivity*, 18(1):201–218, 2014.
- [32] A. Kalauch and O. van Gaans. Disjointness in partially ordered vector spaces. *Positivity*, 10(3):573–589, 2006.
- [33] A. Kalauch and O. van Gaans. Ideals and bands in pre-Riesz spaces. *Positivity*, 12(4):591–611, 2008.
- [34] A. Kalauch and O. van Gaans. Directed ideals in partially ordered vector spaces. *Indag. Math. (N.S.)*, 25(2):296–304, 2014.
- [35] A. Kalauch and O. van Gaans. *Pre-Riesz spaces*. De Gruyter, Berlin, 2018.
- [36] N. J. Kalton and P. Saab. Ideal properties of regular operators between Banach lattices. *Illinois J. Math.*, 29(3):382–400, 1985.
- [37] S. Kaplan. The second dual of the space of continuous functions, II. *Trans. Amer. Math. Soc.*, 93(2):329–350, 1959.
- [38] S. Koshkin. A short proof of the Arendt-Chernoff-Kato theorem. *Arch. Math. (Basel)*, 101(2):143–147, 2013.
- [39] M. A. Krasnosel’skij, J. A. Lifshits, and A. V. Sobolev. *Positive Linear Systems*. Heldermann Verlag, Berlin, 1989.
- [40] W. A. J. Luxemburg and A. C. Zaanen. *Riesz Spaces I*. North-Holland, Amsterdam, 1971.
- [41] H. Malinowski. *Pre-Riesz spaces: Structures and Operators*. PhD thesis, TU Dresden, 2017.
- [42] P. Meyer-Nieberg. *Banach Lattices*. Springer-Verlag, Berlin, Heidelberg, New York, 1991.
- [43] R. Nagel and U. Schlotterbeck. Basic results on semigroups on Banach spaces. In R. J. Nagel, editor, *One-Parameter Semigroups of Positive Operators*, volume 1184 of *Lecture Notes on Mathematics*, chapter A-I, pages 1–24. Springer Verlag, Berlin, Heidelberg, New York, Tokyo, 1986.

- [44] R. Nagel and U. Schlotterbeck. Positive semigroups on Banach lattices. In R. J. Nagel, editor, *One-Parameter Semigroups of Positive Operators*, volume 1184 of *Lecture Notes on Mathematics*, chapter C-I, pages 233–246. Springer Verlag, Berlin, Heidelberg, New York, Tokyo, 1986.
- [45] R. J. Nagel, editor. *One-Parameter Semigroups of Positive Operators*. Lecture Notes Math. 1184, Springer Verlag, Berlin, Heidelberg, New York, Tokyo, 1986.
- [46] B. Randrianantoanina. Injective isometries in Orlicz spaces. *Jarosz, Krzysztof (ed), Function spaces. Proc. of the 3rd conf., Edwardsville, IL, USA, 1998. Providence, RI: Amer. Math. Soc. Contemp. Math., 232:269–287, 1999.*
- [47] H. H. Schaefer. *Topological Vector Spaces*. Macmillan, New York, 1966.
- [48] H. H. Schaefer. *Banach Lattices and Positive Operators*. Springer-Verlag, Berlin, Heidelberg, New York, 1974.
- [49] H. R. Thieme. Spectral radii and Collatz–Wielandt numbers for homogeneous order-preserving maps and the monotone companion norm. In *Ordered Structures and Applications*, pages 415–467. Birkhäuser, 2016.
- [50] O. van Gaans. *Seminorms on ordered vector spaces*. PhD thesis, University of Nijmegen, 1999.
- [51] O. van Gaans. Subspaces of normed Riesz spaces. *Positivity*, 8(2):143–164, 2004.
- [52] O. van Gaans. An elementary example of an order bounded dual space that is not directed. *Positivity*, 9(2):265–267, 2005.
- [53] O. van Gaans and A. Kalauch. Bands in pervasive pre-Riesz spaces. *Oper. Matrices*, 2(2):177–191, 2008.
- [54] M. van Haandel. *Completions in Riesz Space Theory*. PhD thesis, University of Nijmegen, 1993.

- [55] J. van Waaij. Tensor products in Riesz space theory. Master's thesis, Leiden University, 2013.
- [56] B. Z. Vulikh. *Introduction to the Theory of Cones in Normed Spaces (Russian)*. Izdat. Kalinin Univ., Kalinin, 1977.
- [57] A. W. Wickstead. Extremal structure of cones of operators. *Q. J. Math.*, 32(2):239–253, 1981.
- [58] A. W. Wickstead. Converses for the Dodds–Fremlin and Kalton–Saab theorems. *Math. Proc. Camb. Phil. Soc.*, 120(1):175–179, 1996.
- [59] A. W. Wickstead. AL-spaces and AM-spaces of operators. *Positivity*, 4(3):303–311, 2000.
- [60] A. C. Zaanen. *Introduction to Operator Theory in Riesz Spaces*. Springer-Verlag, Berlin, Heidelberg, 1997.





# Index

- $\sigma$ -Dedekind complete, 5
- $\tau$ -totally bounded, 55
- absolute value of an element, 8
- AL-space, 59
- AM-space, 59
- Archimedean, 5
- band
  - in partially ordered vector space, 14
  - in vector lattice, 8
- bipositive, 10
- bounded above, 4
- bounded below, 4
- contractive operator, 85
- Dedekind complete, 5
- Dedekind completion, 12
- disjoint complement
  - in partially ordered vector space, 14
  - in vector lattice, 8
- disjoint elements
  - in partially ordered vector space, 13
  - in vector lattice, 8
- dispersive, 85
- dual
  - order, 51
  - topological, 51
- fordable, 36
- generating cone, 3
- generating subspace, 10
- generator, 75
- ideal
  - in partially ordered vector space, 13
  - in vector lattice, 8
- majorizing subspace, 4
- negative part, 8
- net
  - decreasing, 5
  - increasing, 5
  - o-convergent, 5
- norm
  - canonical half, 84
  - half, 84
  - monotone, 20
  - order continuous, 45
  - regular, 45
  - Riesz, 20
  - semimonotone norm, 48, 66

- strict half, 84
- normal cone, 66
- one-parameter semigroup, 75
- operator
  - band preserving, 69
  - disjointness preserving, 16
  - local, 69
  - order bounded, 15
  - order continuous, 25
  - positive, 15
  - regular, 16
- order dense, 9
- order interval, 4
- order unit, 4
- ordered Banach space, 67
- ordered normed space, 20
- partial order, 2
- partially ordered vector space, 2
- pervasive, 19
- positive cone, 3
- positive element, 2
- positive off-diagonal property, 91
- positive part, 8
- relative uniform closure, 6
- relatively uniformly closed, 6
- relatively uniformly convergent, 6
- Riesz completion, 11
- Riesz decomposition property, 38
- Riesz dual system, 56
- Riesz homomorphism, 34
- Riesz\* homomorphism, 34
- semigroup
  - disjointness preserving, 75
  - strongly continuous, 75
- set
  - directed, 4
  - o-closed, 6
  - order bounded, 4
  - solid
    - in partially ordered vector space, 13
    - in vector lattice, 8
  - total, 89
- space
  - order unit, 4
  - pre-Riesz, 9
  - Riesz, 7
- strictly dispersive, 85
- subdifferential, 85
- topology
  - absolute weak, 55
  - consistent, 55
  - restriction, 56
- u-uniformly Cauchy sequence, 6
- uniformly complete, 6
- vector lattice, 7
- vector lattice cover, 11
- wedge, 3